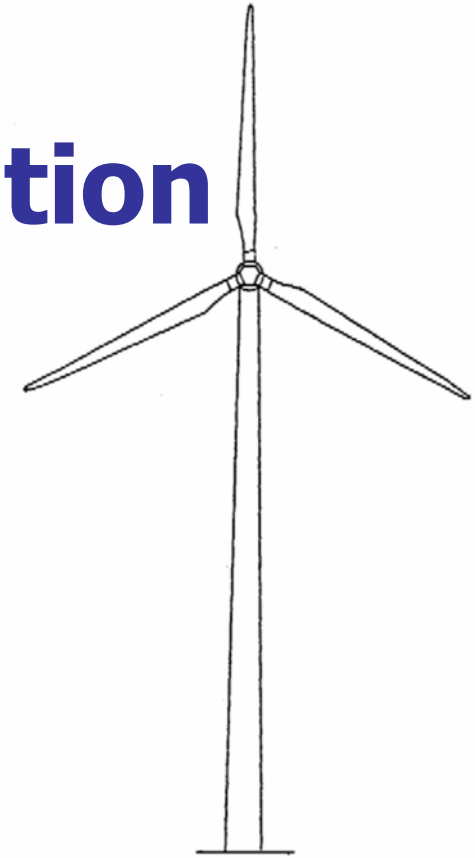
Wind Target Solicitation Workshop



Dora Yen-Nakafuji
Michael Kane
PIER Wind Energy Program

John Butler
Grants & Loans Office

Jesselyn Rosales
Solicitation Administrator

Workshop Agenda

- **Sign-in** **1:00-1:15pm**
- **Introductions & Overview of PIER Wind Program** **1:15-1:30pm**
- **Purpose of the Wind Solicitation** **1:30-2:00pm**
- **Solicitation Administrative Topics** **2:00-3:00pm**
  - Eligibility
  - Funding & Match Funding Requirements
  - Solicitation Process & Schedule
  - Administrative Requirements
  - Screening
  - Evaluation and Scoring
- **Q&A** **3:00-3:30pm**

Commission Programs

- Provisions of AB 1890 (1996) authorized restructuring of California's electric services and directed activities of Energy Commission related to renewable energy
- Legislation to collect program funds from California ratepayers via a "public goods surcharge" on electricity use.
- Creation of Complementary Programs:
  - Renewable Energy Program (REP)
  - Public Interest Energy Program (PIER)

Renewable Energy Program

- Program goal to increase total renewable electricity production in California
- Program provides market-based incentives for new & existing facilities, consumer rebates for installing new renewable energy systems & consumer education
- 5 Program categories:
  - *Existing Renewable Resources*
  - *New Renewables*
  - *Emerging Renewable Resources ("Buy down program")*
  - *Customer Credit*
  - *Consumer Education*
- Website: http://www.energy.ca.gov/renewables/index.html

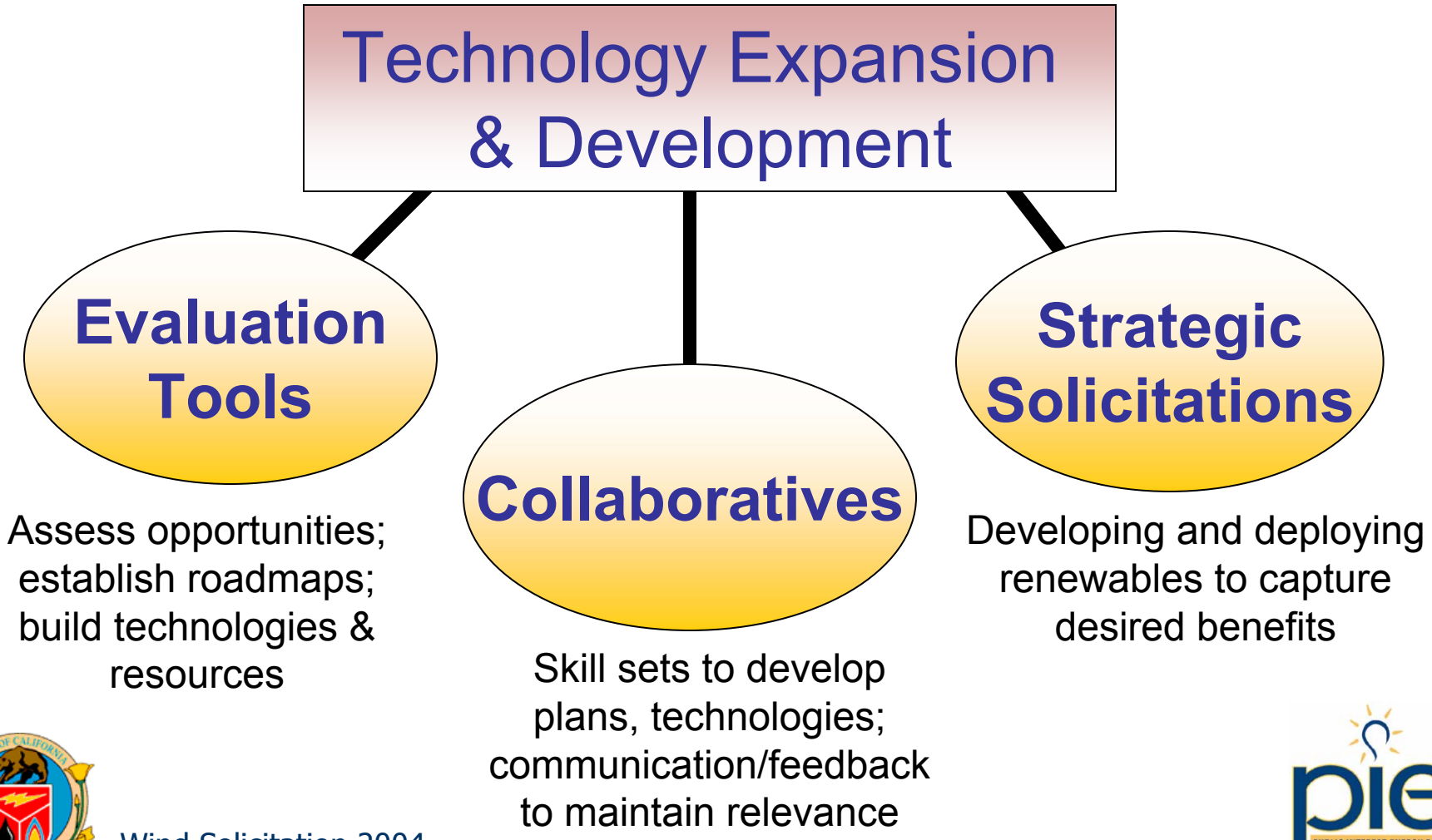
PIER Program

- Public Interest Energy Research Program (PIER) to conduct RD&D programs
  - Improve the quality of life for California citizens by providing environmentally sound, safe, reliable and affordable energy services and products
- The PIER program areas:
  - ***Renewable Energy Technologies***
  - *Environmentally Preferred Advanced Generation*
  - *Energy Innovations Small Grant*
  - *Residential & Non-residential Buildings End-Use Energy*
  - *Energy-Related Environmental Research*
  - *Energy Systems Integration*
- Website: http://www.energy.ca.gov/pier/index.html

PIER Renewables Mission & Objectives

- Mission
  - Developing tomorrow's renewables
    - Electricity that is cleaner, more diverse, reliable, safer, and affordable
    - Enhances choices and opportunities
    - Accelerates meeting CA's RPS goals
- Objectives
  - Maximize value - targets of opportunity; multiple benefits; system integration
  - Lower costs - improved performance; added value
  - Expand applications - Renewable DG; bulk power
  - Pursue major advances - Breakthroughs for tomorrow

RD&D Approach/Strategy

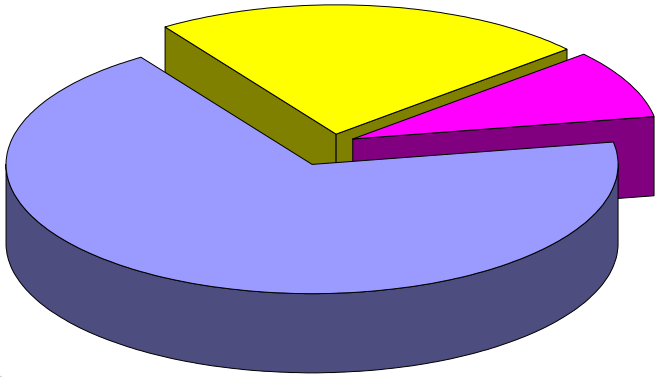


Wind RD&D Goals

- Increase wind energy market penetration
  - Roadmap to meeting CA RPS – 20% by 2017
  - Maximize value of wind generated electricity
- Reduce wind intermittency issues
  - Develop wind forecasting capability
  - Characterize wind performance in meeting demand and peak
- Assess & prioritize CA wind development
  - Repower sites & develop new high-wind sites
  - Tap low-wind resource areas & DG development
  - Integrate other new areas (BLM lands, Native American lands)

PIER Wind RD&D Overview

- Wind Projects Focus Areas
  - Maximize Value of Wind Resources
  - Technology Development & Support
  - Expanding Applications
- Funding Breakdown



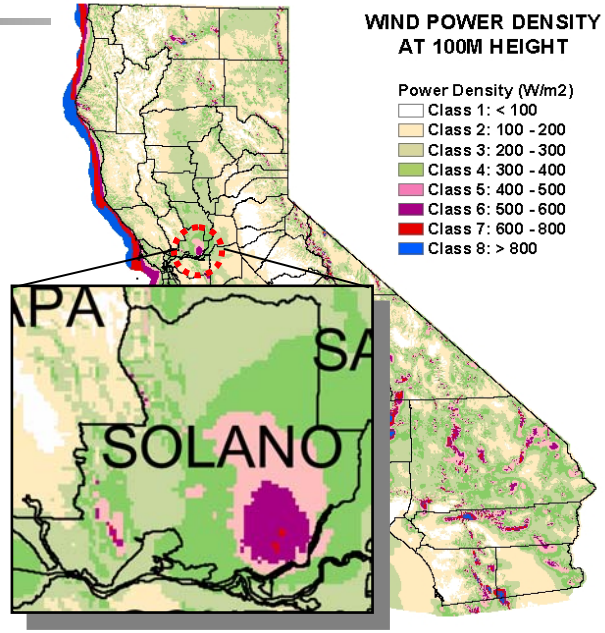
Technology Development = $3.5 M
Maximize Wind Resource Value = $1.2 M
Expanding Applications = $450 K

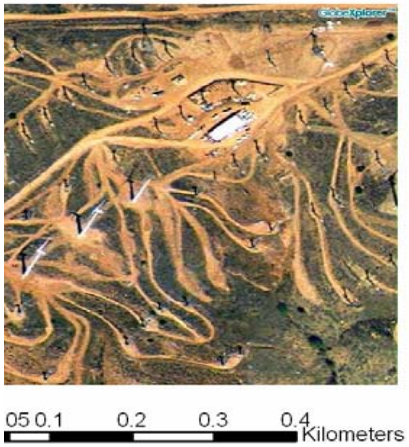
Wind Efforts Total = $5.2 M

*2002-2003 funds

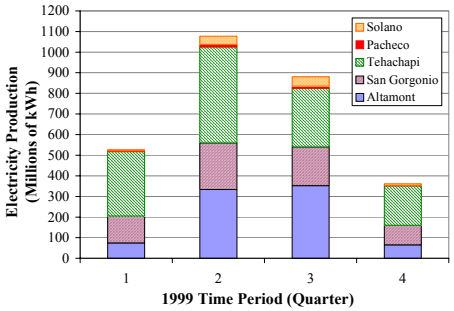
PIER Wind RD&D Efforts

Sodar, tall towers and urban wind resource monitoring projects





High resolution maps & web-based GIS analysis capability



Electronic wind performance database (e-WPRS)

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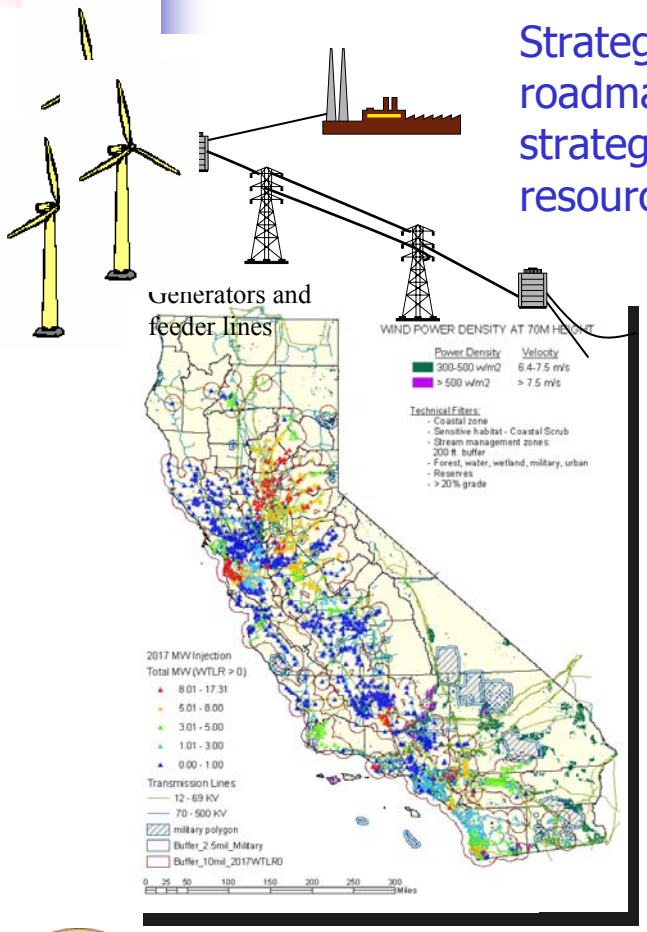
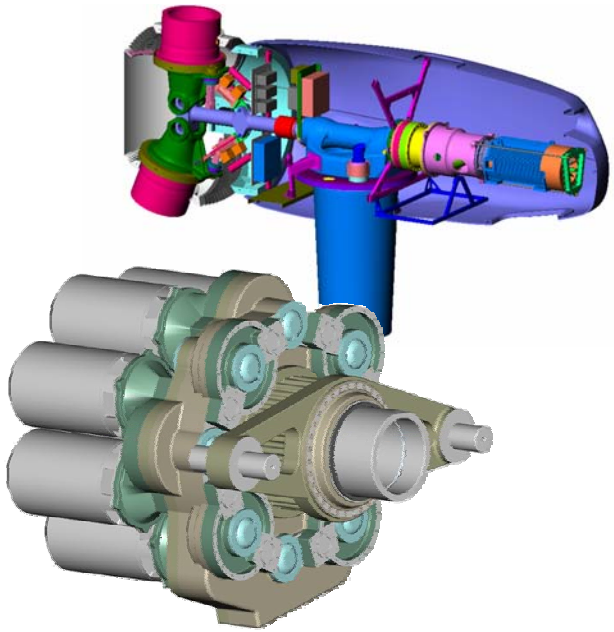
"Research Powers the Future"

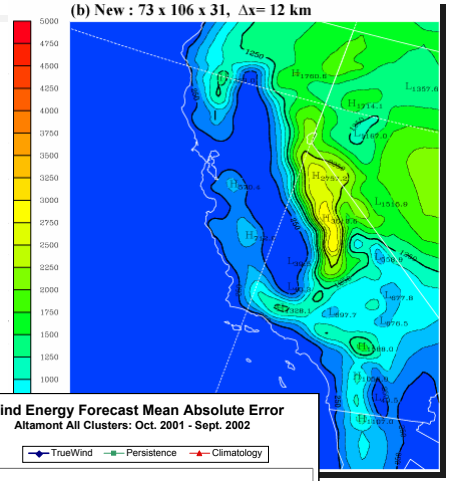
PIER Wind RD&D Efforts

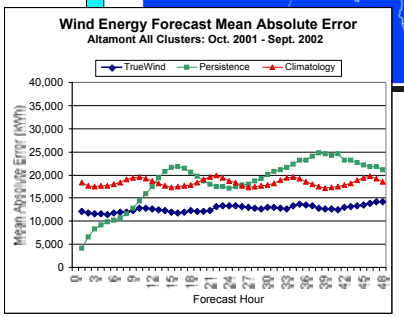


Strategic value assessment as a roadmap to meeting RPS goals by strategically developing renewable resources and transmission upgrades



Advance turbine system and component development





Numerical-based wind forecasting system development and regional trend analysis

Wind Solicitation 2004

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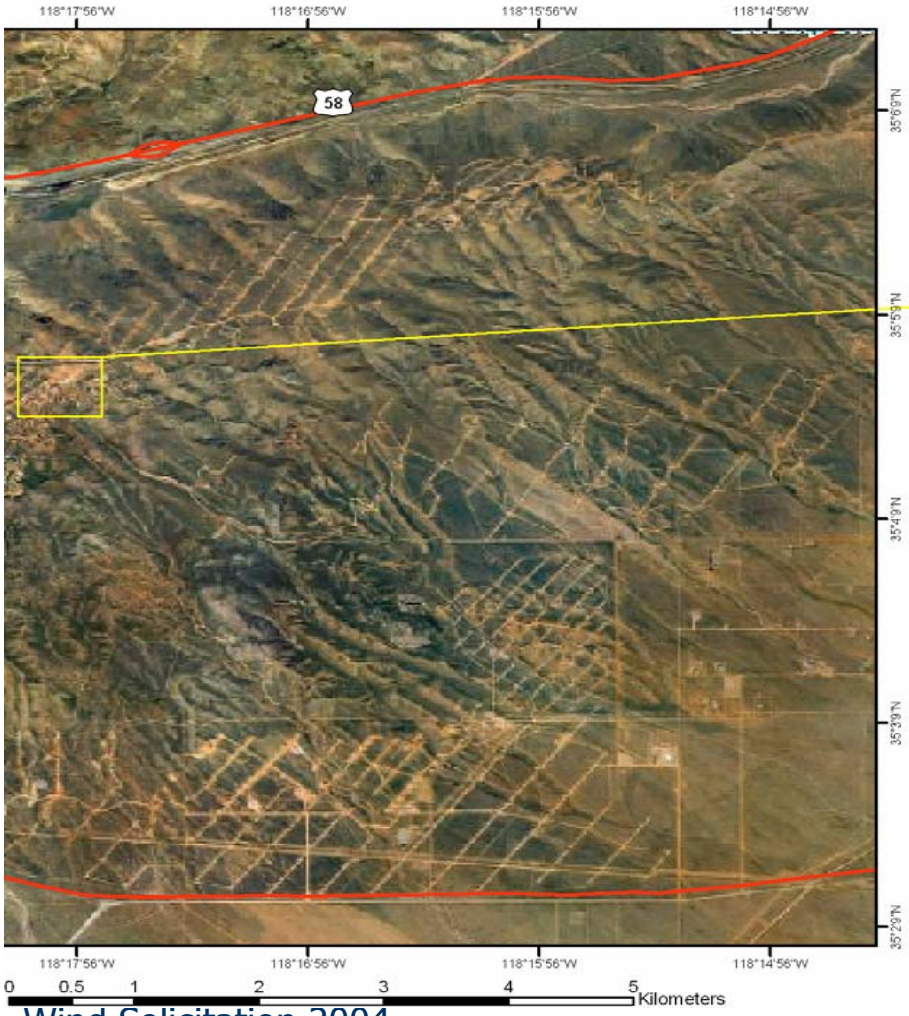
Visualization & Analysis Tools

1. Identify a "footprint" for existing wind resource sites using satellite imagery and provide web-based access to images for analysis
2. Utilize GIS tool to build and locate (lat & long) new and existing turbines
3. Utilize database to address repowering issues such FAA lighting and noise impact on community
4. 3D visualization and graphical overlay of known avian attributes and statistical behavior patterns
5. Integrate bathymetry data for the California coastline and provide web-based access to analysis
6. Rapid update capability

Satellite Perspective

Tehachapi Wind Turbines



Altamont 3D Rendering

Produced by the GIS Center
at LLNL
August 2003

Wind Solicitation 2004

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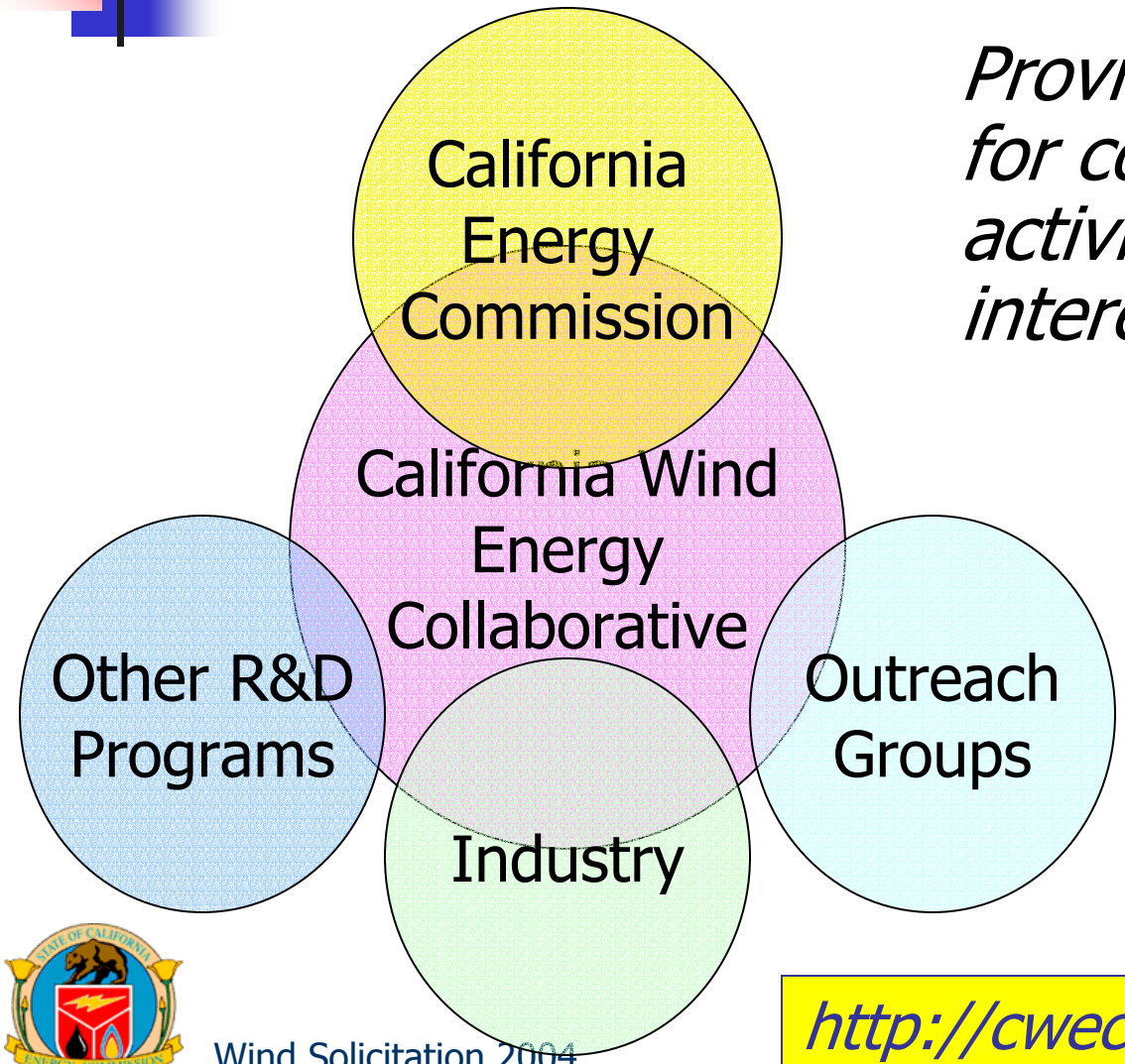
Collaborative Resources



Provide a focal center for coordination of activities of diverse interested parties

Industry
Industry Organizations
Utilities
Universities
Laboratories
Environmental Groups
Public Outreach

http://cwec.ucdavis.edu

Purpose of Wind Solicitation

- Goals
  - Help achieve state's RPS goals and increase penetration of wind generated electricity
  - Accelerate development in California's low speed wind resources regimes
  - Advance intermittency management capability (IMC) to improve integration and dispatchability of wind energy in the state's electricity system

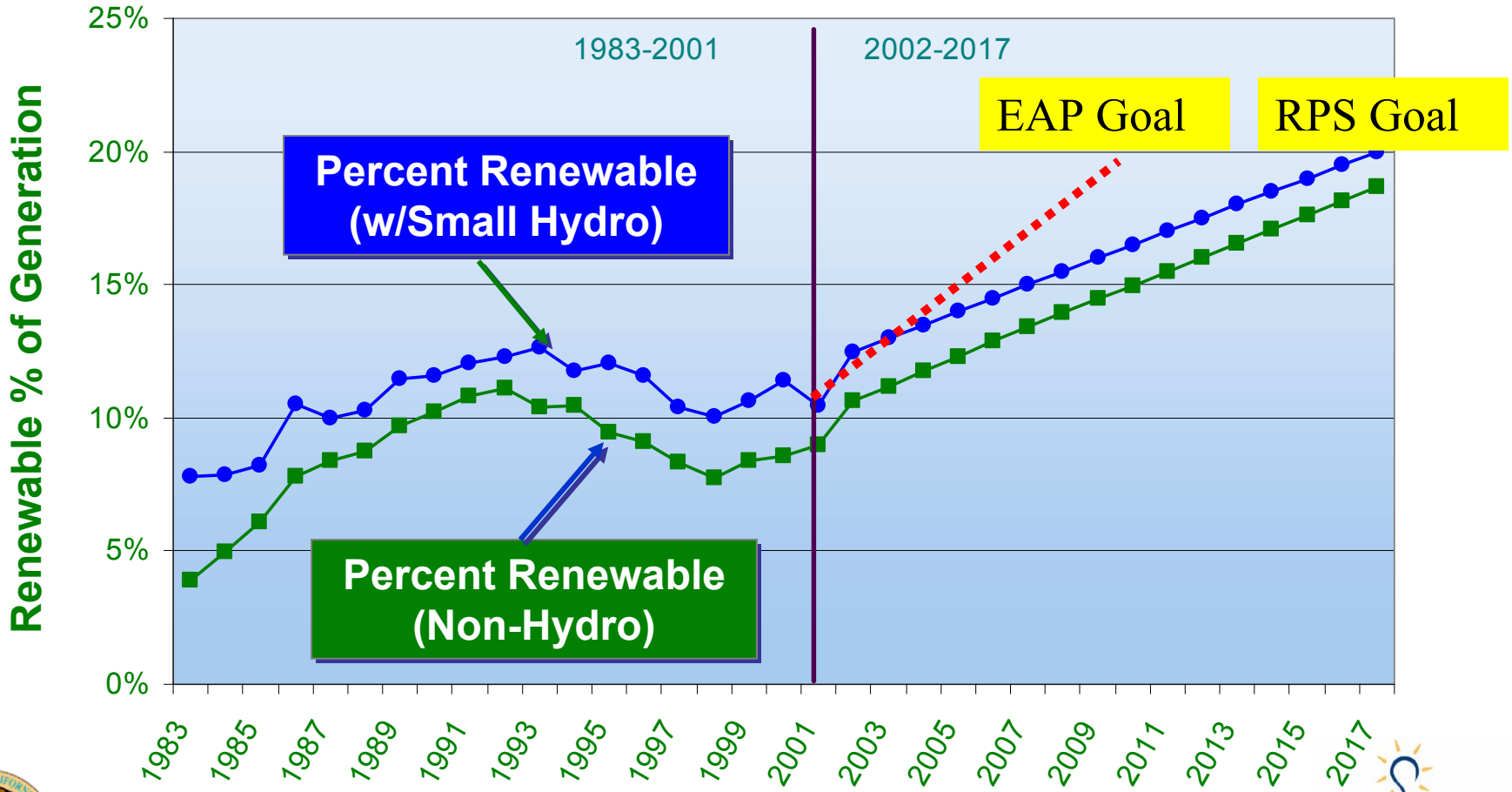
Why Address Low Wind & IMC

- Motivators
  - Economic & Policy
  - State Resource
  - Technological Advances
- Integration Challenges
  - Transmission
  - Intermittency

Economic & Policy

- Economic – wind energy most financed and developable renewable technology
- Policy – 20% Renewable generation by 2017 with lion's share from wind resources
- PIER Mission – provide environmentally safe, affordable & reliable, diverse energy services/choices to the public
  - Increase affordable wind energy development and work to minimize intermittency issues
  - Displace NOx, CO_2 and other sources of emissions
  - Create job opportunities and invest in developing a workforce

Rapid Growth - RPS

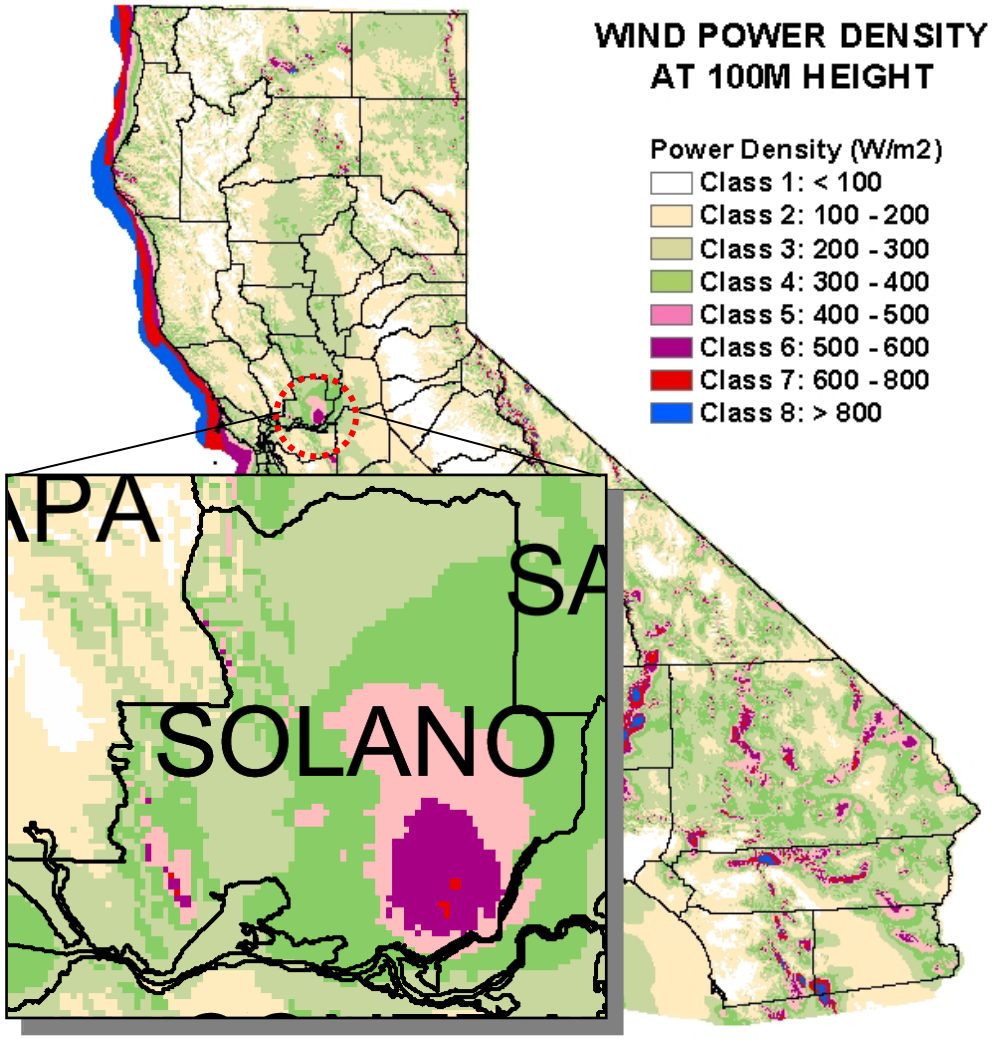


RPS: renewables to 20% by 2017 EAP: 20% by 2010

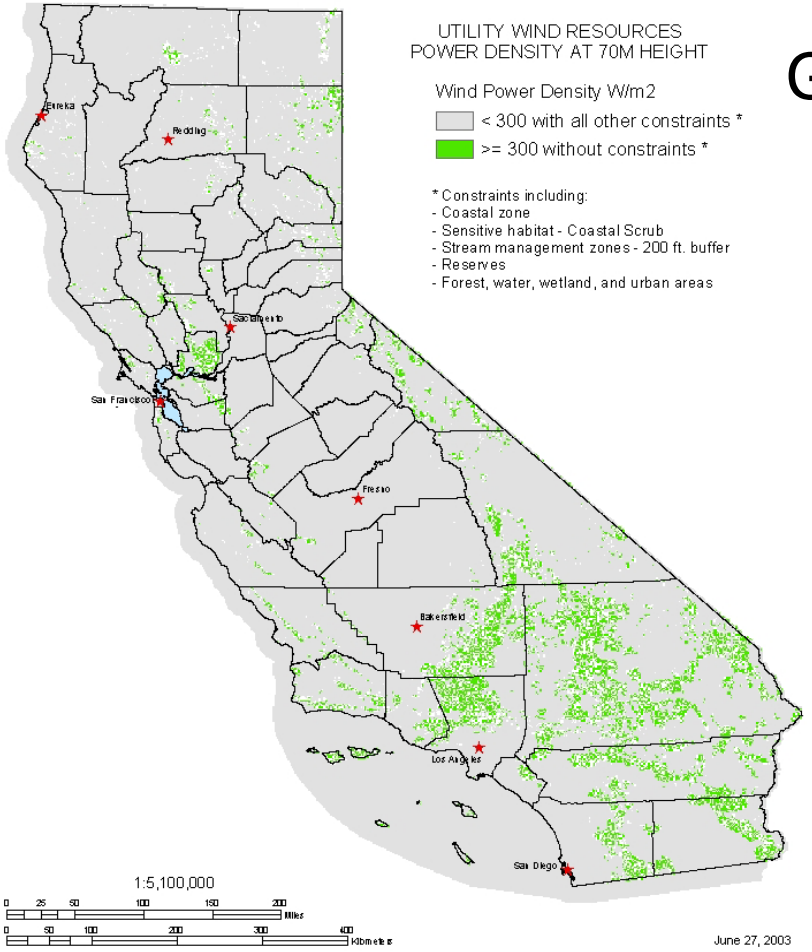
pier PUBLIC INTEREST ENERGY RESEARCH "Research Powers the Future"

Wind Resource Assessments

- High resolution maps for CA wind resources
  - 200 × 200 m vs kilometer resolution
  - Multi-level wind speed & power (30m, 50m, 70m, 100m) vs 10 m level
- Wind resource characterization



CA Wind Potential – 70m



Gross Wind Potential: 295,000 MW

Technical Potential*: 99,000 MW

Current Installed: 1,852 MW

Opportunity: 97,000 MW

Technical Filters (excluded areas):*

Resource > 300 W/m ^{2}

Topography grade > 20%

Bodies of Water

Forested Areas

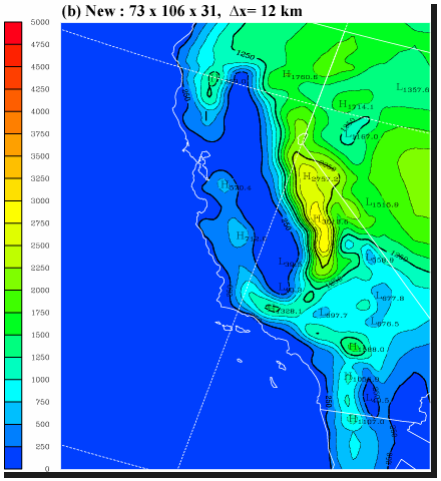
Urban Areas

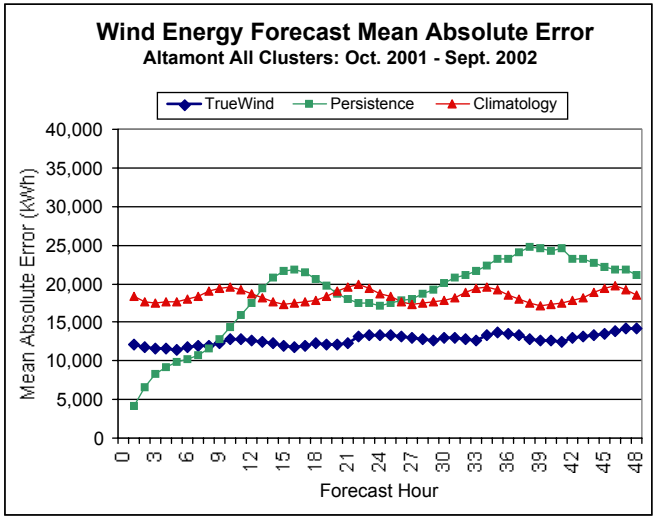
State/National Parks & Monuments

Others (Natural Reserves)

Wind Forecasting

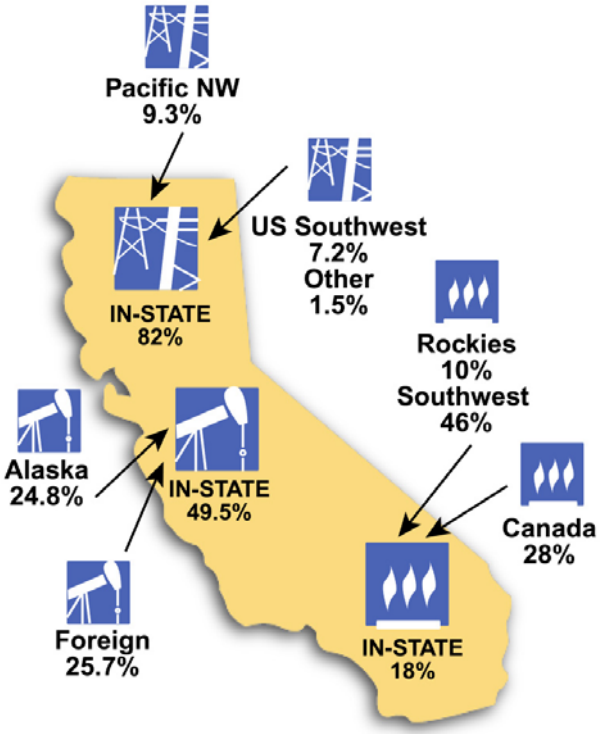
- Develop short-term forecasting (0-3.5 hours ahead) capability
- Improve long-term forecast (24-48 hours ahead)
- Attempt to identify and reduce sources of forecast error
- Forecast for other sites
- Incorporate into CaISO electronic management system
- Close coordination with CaISO & utilities to ensure that needs are addressed
- Previous forecasting effort:
  - concentrated on developing a long-term wind forecast capability
  - demonstrated the value of including meteorological effects to improve wind forecast
  - provided impetus for CaISO to consider integrating wind forecasting into their scheduling and operations





Transmission & Integration Issues

- Insufficient transmission and distribution (T&D) infrastructure
- Limited peak generating capacity
- Lack of a diversified resource and generation supply system
- Rapid growth in renewables, but no "game plan" (RPS)
- Integration problems associated with an intermittent resource

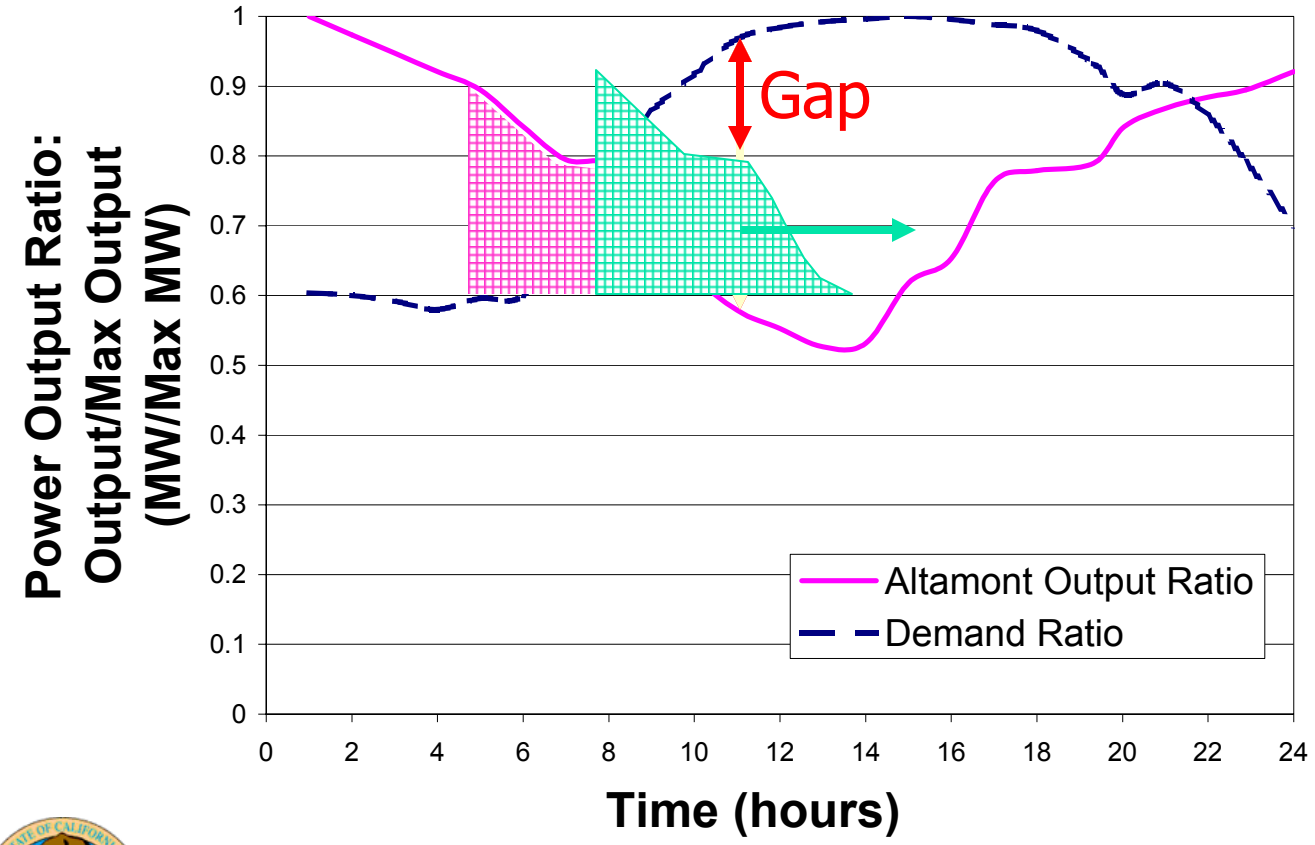


California's Energy Sources

Tapping into Low Wind Speed Areas

- Industry priority is developing high wind speed sites and re-powering
- Near-term: Developing reliable technology to tap into low wind speed resource areas
  - Wind turbine system improvements and control
  - Taller turbines, larger blades
  - Low wind speed shear profiles & characteristics
  - Closer to demand centers (50 to 100 mi) & rural area electricity users
  - Potential to defer transmission upgrade or new infrastructure

Address Intermittency



IMC strategies:

- Firm wind with other technologies
- Time shift capability
- Smoothing wind profile
- Increase IMC confidence

Administrative Topics

- Eligibility
- Match Funding Requirements
- Solicitation Process & Schedule
- Administrative Requirements
- Screening
- Evaluation and Scoring

Eligibility - Who may apply?

- Wind turbine manufacturers and technology developers
  - Possess a demonstrated commercialization capability (bringing large complex systems/products to market)

  AND

  - Have a U.S. base of operation (i.e., satellite R&D, manufacturing, subassembly facilities)

Eligibility - Team

- Minimum Recommended Team:
  - Technology development (i.e., wind turbine technologies R&D, intermittency/storage devices R&D, other renewable generation technologies)
  - Transmission integration (i.e., utility providers, municipal utilities)
  - Intermittency integration (i.e., transmission and interconnection technologists)
- Teams of subcontracts (individuals, businesses, land and farm owners, public/private research institutions, national laboratories and developers)

Eligible Projects

- PIER program funds can **only** be used for energy research, development and demonstration projects that benefit California ratepayers and are not adequately provided for by competitive and regulated energy markets.
- Projects **must** directly relate to demonstration of full wind turbine systems in a low speed wind regime (NREL Class 3-4 at 10m above ground) coupled with IMC demonstration
- Demonstration projects **must** be located in California
- Project **must** provide tangible benefits and meet performance targets

Funding

- Up to $5 million available PIER grants
- Maximum of $1.75 may be requested by a single project
- Projects are funded based on scored rank beginning with Rank 1

Match Fund Requirement

- Match funds are required by all applicants
- Minimum applicant match funds: 50% of total project costs
  - Public sources allowed with minimum of 20% of cost share from private sources
- Applicant Match Share: cash, equipment, and/or in-kind services
- Qualifications as a Match Share:
  - Dedicated to the project
  - Based on documented current market values
  - Depreciated or amortized over the project's life

Solicitation Process & Schedule

Pre-Proposal Conference	August 12, 2004 1:00 – 3:30pm
Post Q&A from Pre-Proposal Workshop (Commission's Web Site)	*Est.* August 19, 2004
Deadline to Submit Proposals	**September 7, 2004 4:00 PM**
Review Proposals	September 8 – October 8, 2004
Interview Applicants (if necessary)	*Est.* October 25 – 28, 2004
Post Notice of Award	*Est.* November 12, 2004
Energy Commission Business Meeting	*Est.* December 15, 2004

Administrative Requirements

- Grants & Loan
  - Delivery of proposals
  - Due date and time
  - # of paper copies, electronic copy
- Application Package

Delivery of Proposal

Applicant's Name
Company Name
Street Address
City, State, Zip Code
Phone #
FAX #

Wind Target Solicitation for Expanded Wind Regime Technology and IMC Demonstration

Grants and Loan Office, MS-1
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814

Submission Deadline

Deadline to Submit Proposals: September 7, 2004 by 4:00pm (PST)

Submit *Original AND 10 bound*, paper hardcopies and electronic files of proposal on CD-ROM by deadline

Late proposals will be rejected

Application Package

- Format for proposal organization provided in manual
- Volume 1 – Administrative
- Volume 2 – Technical & Cost
- Volume 3 – Confidential Information (if applicable)
  - Note Volume II and III shall be kept to a combined maximum of *40 pages* (not including required attachments)

Evaluation Process

- Initial Screening Process
- All proposals that pass the Screening Process will be further evaluated and scored for merit
- Energy Commission staff and outside agencies (i.e., private consultants, national laboratories, federal and state agencies) review and evaluate the proposals
- Scoring will be conducted based on the criteria provided in the manual

Evaluation Process

- Eligible proposals will be ranked in descending order based on total score
- Proposals receiving a weighted score of 105 points or more out of 150 points will be considered for possible funding
- Energy Commission's RD&D Policy Committee recommends how far down the list of ranked eligible proposals to fund (up to available funds)
- Recommendations are presented at an Energy Commission Business Meeting and can be approved as recommended or the Commission can adjust the cut-off lines higher or lower in the ranking

Screening Process

- Administrative
  - Must meet all 5 bullets
- Completeness
  - Proposal must follow proposal format & contents
  - Proposal must contain sufficient information to enable a useful evaluation
- Eligibility
  - Must meet all 5 bullets
- Feasibility
  - Proposal must contain sufficient information to review for technical soundness, market viability and commercialization potential

Scoring Process

- Scoring Committee will give a score from 0 to 10 for each scoring criterion
- Weighting factor is applied to the raw score to arrive at final score for the criteria

Score	Proposal Response
0	Failing Response
1 to 3	Below Average Response
4 to 6	Marginal Response
7	Average/Acceptable Response – Meets relevant considerations, satisfactory
8 to 9	Above Average Response – Meets relevant considerations, convincing
10	Exceptional Response – Complete, specific and superior, both quantitatively and qualitatively

Scoring Criteria

Criterion	Weighting	Maximum possible Score
1. Soundness of Technical Approach and Scientific Baseline	2.0	20
2. Reliability: Improvement in reliability/quality and diversity of California's Electricity	1.0	10
3. Affordability: Improves Energy Cost/Value of California's Electricity	1.0	10
4. Relevance to Solicitation's Targets and Stretch Goals	1.5	15
5. Likelihood of Success and Market Connection	1.5	15
6. Economic Benefits: Successful completion of the proposed project will directly impact local and state economies and state ratepayers	1.5	15
7. Cost Effectiveness of the Project	1.5	15
8. Match Contribution	2.0	20
9. Skills, Knowledge and Experience of Team	2.0	20
10. Other significant factors that increase the project's merit	1.0	10

Commission Contacts

- Dora Yen-Nakafuji, PIER Wind Program
  dyen@energy.state.ca.us
- Michael Kane, PIER Wind Program
  mkane@energy.state.ca.us
- Jesselyn Rosales, Solicitation Administrator
  jrosales@energy.state.ca.us
- John Butler, Grants & Loan Office
  Jbutler@energy.state.ca.us

Q&A

- Provide Name & Affiliation
- All Questions & Answers from the workshop will be posted on the Commission website